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Dated: July 3, 2006 Signature: _____ (Roger A. Heppermann)

Docket No.: 06005/35628A (59-11206) (PATENT)

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re Patent Application of:
Nixon et al.

Application No.: 09/510,053 Confirmation No.: 7646

Filed: February 22, 2000 Art Unit: 2123

For: Integrating Distributed Process Control System Functionality on a Single Computer Examiner: Dr. Kandasamy Thangavelu

REPLY TO EXAMINER'S ANSWER

MS Appeal Brief - Patents
Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

Dear Sir:

INTRODUCTORY COMMENTS

This Reply Brief to Examiner's Answer is submitted in accordance with 37 C.F.R. § 41.41 in response to the Examiner's Answer (mailed May 3, 2006) to the Appeal Brief (filed March 27, 2006). This Reply Brief is being submitted in conjunction with a Request for Oral Hearing under 37 C.F.R. § 41.47 and the requisite fee therefor.

As detailed in the Appeal Brief, there are two underlying, but different grounds of rejection in this case, the first grounds of rejection being applicable to independent claims 1 and 12 (and the claims depending therefrom) and the second grounds of rejection being applicable to independent claim 19 (and the claims depending therefrom). For clarity, these two different grounds of rejection will be discussed separately.

I. Rejection of Claims 1 and 12 as Obvious Over Leibold in View of Brown I

Generally speaking, the Examiner has misunderstood or has ignored the Appellants' arguments with respect to independent claims 1 and 12, and therefore has failed to correct or to even address the deficiencies present within the Examiner's rejection, as pointed out within

the Appeal Brief. In particular, the Examiner has failed to indicate out how either Leibold (U.S. Patent No. 5,818,736) or Brown I (U.S. Patent No. 6,377,859) discloses or suggests simulating, on a single computing device, control modules that are to be implemented during the actual operation of a process control system on different and remotely situated control devices, as recited by each of independent claims 1 and 12. More particularly, the Examiner has failed to point to any motivation or suggestion within either Leibold or Brown I for modifying Leibold to produce a simulation system that simulates, within a single simulation computer, the operation of the multiple control modules that are to be implemented on separate control devices during operation of a process, thereby simulating not only the operation of the various control modules in relation to one another, but also simulating the communications between the different control devices in which these control modules are to be implemented.

As way of reminder, each of independent claims 1 and 12 recites a system or a method that simulates, on a single computer, the operation of and the communication interactions between various process control modules of a distributed process control network in which the various process control modules are designed to be stored in and executed on **different control devices** (e.g., on a process controller and a device such as a field device separated from the process controller) when actually implemented within a process control environment. Leibold merely discloses a simulation system that simulates the interaction of logic modules (called "logic blocks") that are to be stored in and executed on the **same process controller device** (referred to in Leibold as a "logic point" and more specifically identified as the process controller 105 of Fig. 1) when actually implemented within a process control environment. In fact, in the "Grounds of Rejection" section of the Examiner's Answer, the Examiner admits that Leibold does not disclose a simulation system that simulates control modules that communicate with one another in different control devices when used in a process control system. (See Examiner's Answer, Section 9.1, pg. 4; "Leibold does not expressly teach that at least one of the control modules is created to communicate with the further module within the device separated from the distributed controller to perform a control activity.") Thus, the Examiner admits that the simulation

system of Leibold is limited to simulating the interaction of control modules which are created to run within the ***same*** control device or logic point.[1]

Importantly, Leibold makes no provision what-so-ever for simulating the operation of logic blocks to be implemented on devices separated from the process controller 105, i.e., of logic blocks which are stored within different logic points while actually controlling a process. Instead, as indicated in the Appeal Brief, to perform simulation of different logic points using the Leibold disclosure, the Leibold system would need to use separate simulation computers, one for each of the separate logic points (process controllers 105) being simulated, as the Leibold simulation system only simulates the operation of a single logic point (process controller 105). Moreover, Leibold does not discuss or suggest how logic modules stored within separate logic points would communicate with one another for any purpose, much less how such communications could be simulated.

Likewise, while Brown I discloses a distributed process control system having control elements that are implemented in different process control devices (such as in different process controllers and different field devices), and that communicate with one other during operation of the process control system, Brown I is completely silent as to any method of simulating this process control system. Moreover, Brown I does not provide any reason for placing the control modules which are to be executed within separate control devices during operation of a process control system in the same computing device, as to do so would be to destroy the truly distributed configuration of the Brown I control system. Thus, to actually simulate the operation of the Brown I system, the prior art used a separate computing device for each of the logic points or control devices within the Brown I system to be able to simulate the communicative interactions between these separate devices during operation. (See, "Description of Related Art" section of the Nixon et al. application, pg. 3, ln. 27 to pg. 4, ln. 20).

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[1] Regardless of the Examiner's admission, this is in fact the case. In particular, Leibold makes it clear that its simulation system simulates the interactions between multiple logic blocks that are all stored in and executed on the same process controller (i.e., the process controller 105 of Fig. 1). No portion of Leibold referred to by the numerous citations of the Examiner in the Examiner's Answer indicates otherwise. Thus, while Leibold discloses that a logic point (the process controller 105) may be made up of multiple hardware components, such as multiple AND, OR, NAND, etc. logic devices, PLCs, etc., Leibold makes it clear that these multiple hardware components are associated with the same controller device, i.e., the same logic point. (See, Leibold, Col. 6, ln. 42 to Col. 7, ln. 4.) As a result, none of the logic blocks being simulated in the Leibold system perform inter-device communications, i.e., communications between a controller device and a device separated from the controller device, as recited by each of claims 1 and 12.

The Examiner's Answer is less than clear about the exact combination that is being applied in making the obviousness rejection of claims 1 and 12. As best understood by the Appellants however, the Examiner indicates that it would have been obvious to substitute multiple ones of the Brown I control modules, which communicate with control modules in different devices, for multiple ones of the Leibold logic blocks, which do not communicate outside of the process control device in which they are located, to thereby create the claimed system. However, neither Leibold nor Brown I provides any indication or reason for making such a substitution, or provides any hint that such a substitution would work.

The Examiner apparently assumes that these two different types of control modules are interchangeable, and therefore misses a critical distinction between simulating control modules that are designed to be implemented in the same control device and simulating control modules that are designed to be implemented in different control devices; in particular, the necessity of accounting for and simulating the control device to control device communications (i.e., logic point to logic point communications) which must be implemented to provide communications between control modules within separate control devices. Such control device to control device communications are simply not necessary, are not used and are may not even be possible in the Leibold simulation system. In any event, Leibold does not recognize or suggest that the control device to control device communications can or should be simulated. Instead, Leibold is limited to simulating control modules designed to be executed on the same controller device (logic point), without considering or accounting for communications outside of the control device in which the logic modules being simulated are executed. Likewise, Brown I is not at all concerned with simulation activities, and cannot therefore suggest any manner of simulating control device to control device communications, other than possibly using separate simulation computers to perform the simulation of these types of inter-device communications. In any event, Brown I provides no motivation for placing its various control modules, which are designed to be implemented in separate control devices, in the same computing device, as required by claims 1 and 12.

Thus, stated more simply, neither Leibold nor Brown I provides any motivation for placing and executing control modules (or logic blocks) which are created to be executed in different control devices during execution of a process control system, within the same computer for any purpose, much less for the purpose of performing simulation of a process

control system using such control modules. As admitted by the Examiner, Leibold fails to suggest placing, on a single computer or simulation device, control modules or logic modules that are designed to be executed on different controller devices (but to communicate with each other) during operation of the process control system. In fact, it is clear that, had Leibold thought that such a simulation was possible or desirable, Leibold would have disclosed such a simulation system, as Leibold discloses that the distributed process control system thereof can include multiple different process controllers 105 or logic points. (See, Leibold, Col. 7, ll. 5-10). None-the-less, despite disclosing a process control system having multiple process controller devices (i.e., logic points), with each controller device presumably have multiple logic blocks therein, the Leibold disclosure is purposefully limited to simulating the operation of each logic point separately. Had Leibold thought it was possible to simulate the operation of multiple logic points (i.e., multiple ones of the process controllers 105) on the same simulation computer, Leibold could have disclosed this operation. Instead, the Leibold system is limited to simulating the operation of the logic blocks within a single logic point, and thereby purposefully does not disclose or suggest simulating, on a single simulation computer, the operation of logic blocks which are stored and executed within different controller devices and yet which interact with one another during operation of the process via inter-device communications.

Likewise, Brown I fails to provide any motivation or suggestion for placing control modules which are designed to be implemented in different controller devices, within the same computing device for any reason, much less for the purpose of creating a simulation system. In fact, as noted above, Brown I does not discuss or suggest any manner of simulating the distributed process control system described therein, much less doing so by placing the various control modules which are designed to be executed in different control devices within the same computing device. The Examiner has simply failed to point to any actual motivation for placing any of the control modules of Brown I, which are to be implemented in different control devices, in the same computing device. In fact, the only "motivation" relied upon by the Examiner is the general statement in Brown I that using a standard and open communication protocol to implement communications between different devices enables devices made by different manufactures to be used in the same process control system. (See e.g., Examiner's Answer, pg. 4, ln. 21 to pg. 5, ln. 3; pg. 5, ln. 20 to pg.

6, ln. 2; pg. 6, ll. 19-23; et seq.) However, this statement has nothing to do with, and in no manner suggests placing control modules that are designed to be implemented in different control devices in the same computing device, which is required by the claimed simulation system.[2] Thus, the statement of "motivation" pointed to by the Examiner fails to suggest making the combination actually being claimed, and in fact makes a completely different suggestion, i.e., that control modules designed to be implemented in different devices should in fact be placed in different devices (which can be devices made by different manufacturers). In no manner is this statement in Brown I a suggestion to place control modules designed to be executed in different control devices during operation of a process control system in the same computing device (as required by the claimed simulation system) for any reason, much less for performing simulation.

In his response to the arguments provided in the Appeal Brief, the Examiner appears to attempt to circumvent the deficiencies in his rejection by stating that it would have been obvious to ***change*** the control modules within the Leibold simulation system to be control modules which are designed to be implemented in different controller devices during operation of the process control system, instead of control modules designed to be implemented in the same controller device, as taught by the Leibold system. Even assuming for the sake of argument that this modification to the Leibold logic blocks is possible and results in the claimed system, the Examiner has failed to point to any teaching or motivation for making this change to the Leibold system. Leibold certainly does not provide any reason for making such a change, as to do so would cause the Leibold simulation system to no longer simulate the operation of the actual control network described in Leibold. Likewise, Brown I provides no motivation for making a change to control modules of a simulation system. In essence, the Examiner is suggesting that it would have been obvious to change the Leibold logic modules to be modules that perform inter-device communications to thereby simulate, not the process control system described in Leibold, but the completely different type of process control system described in Brown I. While, seemingly simple to do, neither

[2] Instead, this statement provides a motivation for making the actual distributed process control system of Brown I, that is, one in which control modules are placed in and are executed in different control devices which communicate with one another using an open and standard communication protocol. Appellants simply do not understand how this statement can be a motivation to create a simulation system for the Brown I control system that operates in a completely different manner, i.e., by having control modules stored on the ***same*** computer or control device.

Leibold nor Brown I actually suggests making this change. In fact, making this change to the Leibold simulation system would make the Leibold system no longer work for its intended purpose, i.e., simulating logic modules that are all stored in the same controller device during operation of the process control system. Thus, Appellants submit that the Examiner is applying hindsight analysis, as the only suggestion for placing the control modules of the Brown I system in a single computer comes from the Appellants' disclosure.

Having provided this general discussion of the inadequacies of the Examiner's logic, for completeness, Appellants will now address the Examiner's particular responses to the contentions raised in the Appeal Brief in the order they are presented.

A. Lack of *Prima Facie* Case of Obviousness

The Examiner initially defends the Examiner's claim that a *prima facie* case of obviousness has been presented by indicating that Appellants' invention comprises three basic elements that are highlighted in bold face in the Examiner's Answer. Examiner's Answer, pg. 20, Section 10.1.1. First, Appellants note that reducing an invention to a gist or thrust is improper, and that the Examiner is required to consider the claims as a whole. MPEP 2141.02. The Examiner's implicit reduction of pending claims to three bold faced phrases reveals that the Examiner's arguments and understanding throughout the prosecution of this case appear to have been based on an improper reduction of the claims at issue to a gist or a thrust. For this reason alone, the Examiner's rejection should not be upheld.

Second, the Examiner's Answer does not provide support for the three elements of a *prima facie* case obviousness. The first element of the *prima facie* case of obviousness is that there must be some suggestion or motivation, either in the references themselves or in the knowledge generally available to one of ordinary skill in the art, to modify the reference or to combine reference teachings. The Examiner's Answer argues that motivation for making the claimed combination of claims 1 and 12 can be found in Brown I which "teaches that at least one of the control modules is created to communicate with the further module within the device separated from the distributed controller to perform a control activity" as that "allows devices made by different manufacturers to interoperate, the process control to be decentralized and the distributed control systems to be simplified." See Examiner's Answer, pg. 21. However, as discussed above, this statement at best provides a motivation for

creating and using control modules in different control devices. It provides no reason for initially creating control modules to be executed in ***different*** control devices, and then placing these control modules in the ***same*** computing device, as is recited by claims 1 and 12. Thus, as generally stated above, the Examiner's motivation to combine Brown I and Leibold has come solely from Appellants' disclosure, which is improper. Again, for this reason alone, the Examiner's rejection should not be upheld.

The second element of the *prima facie* case of obviousness is that there must be a reasonable expectation of success. The Examiner's Answer provides no discussion or explanation as to why one of ordinary skill in the art would expect success in the combination of Leibold, which involves simulation systems, with Brown I (or Brown II for that matter), which do not involve simulation systems of any kind. Therefore, the Examiner has failed to support the second element of the *prima facie* case of obviousness, and for this further reason the Examiner's rejection should not be upheld.

The third element of the *prima facie* case of obviousness is that the prior art reference (or references when combined) must teach or suggest all of the claim limitations. The failure of the Examiner to support the third element of a *prima facie* case of obviousness will be shown in detail in the sections below, and results in yet another reason that the Examiner's rejection should not be upheld.

B. General Inapplicability of Leibold and Brown I to Claims 1 and 12

In response to the Examiner's Answer at 10.1.2, page 23, Appellants will again focus on independent Claims 1 and 12 for clarity. Appellants have previously noted that while Leibold discloses a simulation device for a distributed process control system, it is clear that the Leibold simulation computer only simulates the logic located in or associated with a single controller device, i.e., the process controller 105 of Fig. 1. See, for example, Leibold, Col. 5, ll. 50-53 and 63-67; Col. 6, ll. 42-56, which clearly state that, while multiple logic blocks may be simulated, each of the simulated logic blocks is disposed within or is associated with the same "logic point" i.e., logic device. The Examiner's Answer cites to various portions of Leibold that disclose a plurality of items in the process control system itself, including a plurality of controllers (Examiner's Answer, points 1., 6., and 8., pp. 24-26), and a plurality of logic *blocks* (Examiner's Answer, points 2., 5., 7., and 8., pp. 24-26).

However, a logic *point* is always referred to in the singular (Examiner's Answer, points 4., and 7., pp. 24-26). Thus, even though Leibold notes that multiple controllers 105 may be disposed within the process control system (Examiner's Answer, point 6., pg. 25), the logic *point* being simulated is always shown and discussed in the singular, and is discussed as being associated with a single process controller 105 (Examiner's Answer, points 4. and 7., pp. 24-25). Thus, while Leibold may have multiple logic *blocks* in a single logic *point*, none of the portions of Leibold cited by the Examiner's Answer support the Examiner's final conclusion that a "single computer may also simulate multiple logic points of multiple controllers." Examiner's Answer, pg. 26. In fact, contrary to the Examiner's contention, Leibold does not disclose or suggest a simulation system that simulates the interaction of two control modules associated with different control devices. Instead, Leibold teaches that simulation of a process control network must be accomplished on a logic-point-by-logic-point basis. Thus, as previously noted by Appellants, even if it were possible to modify the Leibold process control system to be a distributed system having control modules executed in different devices, the basic teaching of Leibold would require multiple simulation computers, that is, one for each logic point, to simulate this system.

C. Use of Brown I with Leibold

In response to section 10.1.3, page 26, of the Examiner's Answer, it appears that the Examiner is picking and choosing particular phrases from Appellants' claims in determining the applicability of Brown I. Appellants note that the Examiner must consider the claims as a whole. MPEP 2142 and 2143.03. Further, the cited portion of Brown I in the Examiner's Answer does not teach or suggest anything with respect to control modules, and instead merely indicates that various devices from different manufacturers may communicate over a common communications bus using a common or open communication protocol. Examiner's Answer, pg. 27. Appellants respectfully submit that common communications protocols and communication buses do not teach or suggest "a configuration application stored in the memory of the computer which, when executed on the user workstation or the computer, creates one or more control modules for execution by the distributed controller and a further module for execution by a device separated from the distributed controller, wherein at least one of the control modules is created to communicate with the further module within the

device separated from the distributed controller to perform a control activity" as recited in claim 1 and in analogous language in claim 12. Also, the Examiner's Answer appears to admit that Brown I is unrelated to simulation, which further works against the Examiner's claim that there is a motivation to combine Leibold and Brown I. See Examiner's Answer, First Sentence, pg. 27.

D. Specific Lack of Teachings or Suggestions in Leibold

In response to section 10.1.4 at page 28 of the Examiner's Answer, Appellants respectfully submit that the disclosure of providing a definition of the rule base for the control rules in Leibold is not the same as disclosing the step of creating the claimed control modules. In particular, the mere existence of common communication protocols in Brown I and the creation of a rule base in Leibold do not teach or suggest the creation of a control module "for execution by the distributed controller," "to communicate with the further module to perform the control activity" or "to simulate the operation of the one of the control modules including simulating communicating with the further module to thereby simulate operation of the distributed process control system." In effect, the Examiner has not shown how the limited disclosure of Leibold, which the Examiner admits does not involve communications between control modules in different devices (see e.g. Examiner's Answer, pp. 28-29), is suddenly transformed into the control modules of claims 1 and 12 which perform such inter-device communications. Moreover, not only does Brown I fail to provide any teaching with respect to the simulation of control modules, as previously discussed, none of Brown I, Leibold or the Examiner explains how one of ordinary skill in the art would convert the rule base system of Leibold into control modules operable "to simulate the operation of the one of the control modules including simulating communicating with the further module to thereby simulate operation of the distributed process control system" as recited by the claims. Some reasonable expectation of success is needed to make the claimed combination, and the principle of operation of the reference may not be changed (MPEP 2143.01). Thus, the Examiner's conclusory statement that such a transformation occurs is insufficient to teach or suggest the elements of claims 1 and 12. Stated another way, the Examiner is improperly piecing together dissimilar elements in order to arrive at the Examiner's desired conclusion.

Further, with respect to the GUI (see Examiner's Answer, pg. 29), Appellants have not argued that *no* communication system between the GUI and the configuration would exist in Leibold. Instead, Appellants have noted that, with respect to page 4 of the Final Office Action of September 22, 2005, where the Examiner argued that "at least one of the control modules is created to communicate with a user interface module to perform a control activity" (based on Leibold, Col. 4, ll. 5-10), Leibold does not teach or suggest a *control module* with such functionality. The mere existence of some kind of communications system for the GUI in Leibold does not teach or suggest that "at least one of the control modules is created to communicate with a user interface module to perform a control activity" as asserted by the Examiner.

E. Lack of Motivation to Combine Leibold and Brown I

In response to section 10.1.5 at pages 29-30 of the Examiner's Answer, Appellants refer to Section (I) (A) of this Reply Brief ("Lack of *Prima Facie* Case of Obviousness") to show the lack of motivation to combine.

F. Dependent Claims

In response to section 10.1.6 at page 30 of the Examiner's Answer, Appellants respectfully submit that dependent claims 6-8 and 10-11 depend from independent claim 1 and that dependent claims 17-18 depend from independent claim 12. Claims 1 and 12 have been shown above to be allowable. Therefore, dependent claims 6-8, 10-11 and 17-18 are patentable as depending from an allowable base claim and as defining further distinctions over the cited references.

For the above reasons, Appellants respectfully submit that the Examiner has failed to provide a *prima facie* case of obviousness. Therefore, Appellants respectfully request reversal of the Examiner's rejection of claims 1 and 12 and allowance of these claims and the claims depending therefrom.

II. Rejection of Claim 19 as Obvious Over Leibold in View of Brown I and Brown II

Once again, the Examiner has simply misunderstood or has ignored the Appellants' argument with respect to these claims, and therefore has failed to correct or to even address the deficiencies present within the Examiner's rejection, as pointed out within the Appeal Brief. In particular, the Appellants argued that, contrary to the Examiner's contention, no part of the Brown II (U.S. Patent No. 6,192,281) discloses a system having a controller that communicates with field devices and other control devices using a first communication protocol and that also interfaces with a different controller that uses a second and different communication protocol. In continuing with this rejection, the Examiner has simply pointed to the same sections of Brown II cited in the Final Rejection which, as discussed in the Appeal Brief, fail to factually support the Examiner's contention. In particular, each of the sections of Brown II referenced by the Examiner in the Examiner's Answer simply make it clear that, while the Brown II disclosure indicates that the FOUNDATION™ Fieldbus protocol is used in the described embodiment, any other known communication protocol (of which there are many) could be used instead. This disclosure is not the same thing as saying that one part of the Brown II system may use a first communication protocol while a second part of the Brown II system may use a second and different communication protocol.

Based on the detailed nature of the Brown II specification,[3] if there was clear disclosure in Brown II of a controller that communicates with two different devices (one of which is a separate controller) using two different communication protocols, the Examiner should be able to point to specific controller elements shown in the Figures of the Brown II patent or to sections of the disclosure of the Brown II patent that specifically state as much. Instead, the Examiner attempts to rely on general statements that do not specifically disclose this claimed feature. More particularly, the Examiner attempts to convert statements in Brown II which effectively indicate that the specific communication protocol described therein can be replaced with a different communication protocol, into a statement that two different controller protocols can be simultaneously used in the Brown II system. While the Brown II specification clearly supports the former statement, it clearly does not support the latter statement.

[3] Which, interestingly enough, was written and filed by the undersigned attorney.

Instead of providing a specific citation to some disclosure in Brown II of a controller that communicates with two different devices using two different communication protocols, the Examiner attempts to overcome the failure of Brown II to disclose a controller application that simultaneously supports or uses two different protocols by stating that one skilled in the art would know that the controller has to include hardware and software support for two protocols to implement the two claimed protocols. (See, Examiner's Answer, pg. 32.) However, the Appellants' contention is that Brown II does not provide the suggestion or motivation for a controller to simultaneously use two different communication protocols in the first place. Thus, it is irrelevant what one skilled in the art would know in order to implement this multiple protocol configuration, as there is no motivation in Brown II (or the other cited art) for doing so in the first place.

Thus, in response to section 10.1.7 (pg. 31) of the Examiner's Answer, Appellants note that the Examiner is correct in arguing that Brown II shows that a controller capable of communicating using a particular communications protocol will have the necessary software to use that particular communications protocol. However, as Appellants have previously argued, while Brown II discloses the existence of communication protocols that allow for communication between devices from different manufactures, the mere existence of multiple protocols does not teach or suggest "a controller application stored in the memory of the computer, wherein the controller application, when executed on the distributed controller, implements a control module during operation of the distributed process control system and wherein the controller application when executed on the computer communicates with a further controller that uses a different communication protocol than the distributed controller of the distributed process control system" because Brown II does not teach or suggest communication between different controllers in the manner recited by claim 19. Simply demonstrating the existence of multiple protocols does not automatically teach or suggest that communication using two or more protocols is desirable, or how to accomplish such communications.

For these reasons, and reasons essentially the same as those previously discussed in Section I (A) ("Lack of *Prima Facie* Case of Obviousness") above, the Examiner's combination of Leibold, Brown I and Brown II does not produce a system having multiple controller applications that communicate with one another and that use different

communication protocols. Furthermore, none of this cited art provides any motivation for making such a system. Therefore no combination of Leibold and Brown I and Brown II can produce the invention of claim 19.

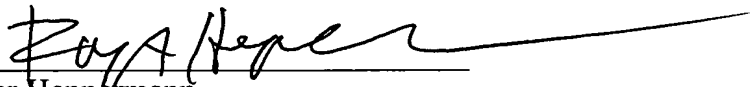
Dependent claims 20-21 depend from independent claim 19, shown above to be allowable. Therefore, dependent claims 20-21 are patentable as depending from an allowable base claim and as defining further distinctions over the cited references.

III. Conclusion

Appellants have demonstrated that the present invention is non-obvious over the references cited by the Examiner. Therefore, Appellants respectfully request reversal of the Examiner's rejection of claims 1-21.

Dated: July 3, 2006

Respectfully submitted,

By 

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